Archives of Biochemistry and Biophysics

VOLUME 174

1976

Academic Press New York and London

A Subsidiary of Harcourt Brace Jovanovich, Publishers

Copyright © 1976 by Academic Press, Inc.

All Rights Reserved

No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopy, recording, or any information storage and retrieval system, without permission in writing from the copyright owner.

Made in the United States of America

Volume Contents

Number 1, May 1976

BIOLOGICAL OXIDATION AND BIOENERGETICS

The Effect of Antimycin A on Cytochromes b_{561}, b_{566}, and Their Relationship to Ubiquinone and the Iron–Sulfur Centers S-1 (+N-2) and S-3
Maria Erecińska and D. F. Wilson 143
Immunochemical Studies on Adrenal Ferredoxin: Involvement of Adrenal Ferredoxin in the Cholesterol Side-Chain Cleavage Reaction of Mammalian Adrenals
Jeffrey Baron 226
Immunochemical Studies on Adrenal Ferredoxin: Involvement of Adrenal Ferredoxin-like Iron–Sulfur Proteins in the Cholesterol Side-Chain Cleavage Reaction of Mammalian Steroidogenic Tissues
Jeffrey Baron 239
Thermodynamic Resolution of Cytochrome P_{450} and Characterization of an Iron–Sulfur Center in Rat Liver Microsomal Preparations
W. John Ingledew, John C. Salerno, and Tomoko Ohnishi 298
Mg^{2+} and the Permeability of Heart Mitochondria to Monovalent Cations
J. P. Wehrle, M. Jurkowitz, K. M. Scott, and G. P. Brierley 312

BIOCHEMICAL GENETICS AND CELLULAR DIFFERENTIATION AND DEVELOPMENT

DNA-Binding Proteins in Yeast. Effect of Growth Phase and Mitochondrial Function
David B. Finkelstein and Ronald A. Butow 52
Selective Synthesis and Modification of Nuclear Proteins during Maturation of Avian Erythroid Cells
Adolfo Ruiz-Carrillo, Lawrence J. Wangh, and Vincent G. Allfrey 273

ENZYME MECHANISMS AND METABOLISM

A Kinetically Important Phosphoryl-Enzyme Intermediary in the Intrinsic Purine Nucleoside-5′-Diphosphokinase Activity of *Escherichia coli* Acetate Kinase
John A. Todhunter, Keith B. Reichel, and Daniel L. Purich 120
Solubilization and Partial Purification of Steroid Sulfatase from Rat Liver: Characterization of Estrone Sulfatase
Masao Iwamori, Hugo W. Moster, and Yasuo Kishimoto 199
Age-Related Alteration of Enolase in the Free-Living Nematode, *Turbatrix aceti*
Harmeshi K. Sharma, Surendra K. Gupta, and Morton Rothstein 324
Triosephosphate Isomerase from Young and Old *Turbatrix aceti*
Surendra K. Gupta and Morton Rothstein 333

LIPIDS

Sodium Dodecyl Sulfate Disc-Gel Electrophoresis Pattern of Protease-Free Chicken Liver Fatty Acid Synthetase
Stella C. Bratcher and Robert Y. Hsu 136
Acyl Carrier Protein Prosthetic Group Exchange and Phospholipid Synthesis in Synchronized Cultures of a Pantothenate Auxotroph of *Escherichia coli*
Michael T. Bauza, John R. de Loach, James J. Aguanno, and Allan R. Larrabee 344

MEMBRANE STRUCTURE AND FUNCTION

Isolation and Characterization of a Liver Plasma Membrane Fraction Enriched in Glucagon-Sensitive Adenylate Cyclase
NORBERT I. SWISLOCKI, JOAN TIERNEY, AND EDWARD S. ESSNER 291

BIOCHEMISTRY OF VIRUSES AND NUCLEIC ACIDS

Purification and Properties of Bacteriophage T4-Induced RNA Ligase
JEROLD A. LAST AND W. FRENCH ANDERSON 167
Nuclear Envelope Fraction Proteins: Isolation and Comparison with the Nuclear Protein of the Avian Erythrocyte
KEITH R. SHELTON, CARRINGTON S. COBBS, JOHN T. POVLISHOCK, AND ROSALIND K. BURKAT 177
The Heavy DNA Satellite of Yeast and Its Relationship to the Ribosomal RNA Genes E. W. LUSBY, JR., AND S. R. DEKLOET 187
Why do Organic Solvents Enhance Mistakes in Aminoacyl tRNA Synthesis?
M. YARUS 350

PHYSICAL BIOCHEMISTRY AND PHYSICAL CHEMISTRY OF MACROMOLECULES

Binding of Hydrogen Donors to Horseradish Peroxidase: A Spectroscopic Study
ABEL SCHEJTER, AMOS LANIR, AND NAVA EPSTEIN 36

POLYSACCHARIDES AND COMPLEX CARBOHYDRATES

Characterization and Comparison of the Major Glycoprotein from Three Strains of Rous Sarcoma Virus MARK J. KRANTZ, Y. C. LEE, AND P. P. HUNG 66
Effect of Retinoic Acid on Chondrocyte Glycosaminoglycan Biosynthesis
STANLEY S. SHAPIRO AND JAMES P. POON 74
Biosynthesis of Bacterial Glycogen. Kinetic Studies of a Glucose-1-P Adenylyltransferase (EC 2.7.7.27) from a Glycogen-Excess Mutant of *Escherichia coli* B
JACK PREISS, CLAUDIA LAMMEL, AND ELAINE GREENBERG 105
The Mechanism of Dextransucrase Action. Biosynthesis of Branch Linkages by Acceptor Reactions with Dextran JOHN F. ROBYT AND HAJIME TANIGUCHI 129

PROTEIN STRUCTURE

Isolation and Characterization of Toxins from Brown Recluse Spider Venom (*Loxosceles reclusa*).
COLLIS R. GEREN, TAK K. CHAN, DARIEL E. HOWELL, AND GEORGE V. ODELL 90
A Kinetic Characterization of the Rabbit Plasmin Isozymes
JAMES M. SODETZ, BERNARD N. VIOLAND, AND FRANCIS J. CASTELLINO 209
The Binding of Penicillin Antibiotics to a Human Liver Protein
MARGARET L. KORNGUTH, ROBERTA A. MONSON, AND CALVIN M. KUNIN 339

PROTEIN SYNTHESIS

DNA-Directed *in Vitro* Synthesis of β-Galactosidase: Dependencies on Elongation Factor Tu and tRNA
HSIANG-FU KUNG, CARLOS SPEARS, AND HERBERT WEISSBACH 100
In Vitro Synthesis of the Large Subunit of Ribulose Diphosphate Carboxylase on 70 S Ribosomes
RUTH ALSCHER, M. A. SMITH, L. W. PETERSEN, R. C. HUFFAKER, AND R. S. CRIDDLE 216

REGULATION OF METABOLISM AND OF ENZYME ACTION

Cellular Redistribution of Metabolites during Glucagon and Insulin Control of Gluconeogenesis in the Isolated Perfused Rat Liver
ROBERTO PARRILLA, MARIA-ISABEL JIMENEZ, AND MATILDE S. AYUSO-PARRILLA 1
Some Characteristics of Adrenal Steroidogenesis and Their Possible Relationships to the Action of the Adrenocorticotropic Hormone
SEYMOUR B. KORITZ AND ABDELRAHMAN M. MOUSTAFA 20
Location and Regulation of Early Enzymes of Sterol Biosynthesis in Yeast
P. J. TROCHA AND D. B. SPRINSON 45
Regulation of Renal Ammoniagenesis. Purification and Characterization of Phosphate-Dependent Glutaminase from Rat Kidney
NORMAN P. CURTHOYS, THERESA KUHLENSCHMIDT, AND SUSAN S. GODFREY 82
Stereoselectivity and Reactivity of α-Chymotrypsin Modified at Methionine-192
GIDEON MOR, ANNE EHRET, AND SAUL G. COHEN 158
Effects of Insulin on Diaphragm Muscle Independent of the Variation of Tissue Levels of Cyclic AMP and Cyclic GMP
SEIICHIRO TARUI, YOSHIKAZU SAITO, MASAFUMI FUJIMOTO, AND TADASHI OKABAYASHI 192
Cyclic Nucleotide Phosphodiesterases of Rabbit Renal Cortex. Characterization of Brush Border Membrane Activities
CHARLES R. FILBURN AND BERTRAM SACKTOR 249
The Regulation of Ornithine Aminotransferase Synthesis by Glucagon in the Rat
ROBERT T. LYONS AND HENRY C. PITOT 262
Serine Transhydroxymethylase: Mechanism of Aldolase Activation by Folate
CLIFTON W. JONES, III, AND D. G. PRIEST 305

STRUCTURAL PROTEINS

Trypsin Digestion of Canine Cardiac Myosin. Low Molecular Weight Fragment of Myosin with High Adenosine Triphosphatase Activity
ASHOK K. BHAN AND ASHWANI MALHOTRA 27

COENZYMES

Lipoic Acid Metabolism in the Rat
JOSEPH T. SPENCE AND DONALD B. MCCORMICK 13

COMMUNICATIONS

ATP Requirement for Binding of ^{125}I-Labeled Globin mRNA to *Artemia salina* Ribosomes
GISELA KRAMER, DAVID KONECKI, J. MIGUEL CIMADEVILLA, AND BOYD HARDESTY 355
Isolation, Purification, and Some Properties of a Lectin and Abrin from *Abrus precatorius* Linn
JASODHARA ROY, S. SOM, AND A. SEN 359
On the Lipoprotein Nature of Glucose-6-Phosphate-Solubilized Hexokinase from Rat Brain: A Reevaluation
JOHN E. WILSON 362

ERRATA

The Relationships among RNA Synthesis, RNA Polymerase Synthesis and Guanosine Tetraphosphate Levels in *Escherichia coli* during Nutritional Shift-up
S. M. BOYLE AND B. H. SELLS 364

Studies on Avian Erythrocyte Metabolism III. Effect of Organic Phosphates on Oxygen Affinity of Embryonic and Adult-type Hemoglobins of the Chick Embryo R. E. Isaacks, D. R. Harkness, J. L. Adler, and P. H. Goldman 364
Announcement 365
Author Index for Volume 174, Number 1 366

Number 2, June 1976

BIOLOGICAL OXIDATION AND BIOENERGETICS

Sodium Periodate, Sodium Chlorite, and Organic Hydroperoxides as Hydroxylating Agents in Steroid Hydroxylation Reactions Catalyzed by Adrenocortical Microsomal and Mitochondrial Cytochrome P_{450}
Jan-Åke Gustafsson, Eugene G. Hrycay, and Lars Ernster 440
Oxidation of Manganous Pyrophosphate by Superoxide Radicals and Illuminated Spinach Chloroplasts
Yasuhisa Kono, Masa-Aki Takahashi, and Kozi Asada 454
Aging of Human Erythrocytes. Differential Sensitivity of Young and Old Erythrocytes to Hemolysis Induced by Peroxide in the Presence of Thyroxine
Richard Walls, K. Sree Kumar, and Paul Hochstein 463
Redox Potentials of the Cytochromes in the Respiratory Chain of Aerobically Grown *Escherichia coli* M. R. Pudek and P. D. Bragg 546
Purification and Properties of a Polyvinyl Alcohol-Degrading Enzyme Produced by a Strain of *Pseudomonas*
Yasuto Watanabe, Nobutake Hamada, Makoto Morita, and Yoshio Tsujisaka 575
Ziram, a Sulfhydryl Reagent and Specific Inhibitor of Yeast Mitochondrial Dehydrogenases M. Briquet, N. Sabadie-Pialoux, and A. Goffeau 684
Oxidative Properties of Swollen Rat Liver Mitochondria
M. Abdul Matlib and Paul A. Srere 705

BIOCHEMICAL GENETICS AND CELLULAR DIFFERENTIATION AND DEVELOPMENT

The Appearance, Properties, and Functions of Gluconeogenic Enzymes in the Liver and Kidney of the Guinea Pig during Fetal and Early Neonatal Development Colin T. Jones and I. Karen Ashton 506

ENZYME MECHANISMS AND METABOLISM

Studies on the "Aerobic" Acetyl-Coenzyme A Synthetase of *Saccharomyces cerevisiae*: Purification, Crystallization, and Physical Properties of the Enzyme
T. Satyanarayana and Harold P. Klein 480
Decarboxylation to Tyramine Is Not a Major Route of Tyrosine Metabolism in Mammals J. H. Fellman, E. S. Roth, and T. S. Fujita 562
Likely Individuality of the Enzymes Catalyzing the Phosphorylation of Choline and Ethanolamine R. K. Upreti, G. G. Sanwal, and P. S. Krishnan 658
Dihydrofolate Reductase from Soybean Seedlings. Characterization of the Enzyme Purified by Affinity Chromatography
V. Anthony Reddy and N. Appaji Rao 675
Isocitrate Lyase from *Pseudomonas indigofera*: pH Dependence of Catalysis and Binding of Substrates and Inhibitors
John E. Rogers and Bruce A. McFadden 695

LIPIDS

Biosynthesis of the β-Diketones of Barley Spike Epicuticular Wax
A. G. Netting and Penny von Wettstein-Knowles 613

MEMBRANE STRUCTURE AND FUNCTION

The Effect of Vitamin D_3 Metabolites on Membrane Proteins of Chick Duodenal Brush Borders Sachiko Moriuchi and Hector F. DeLuca 367
Evidence for a Functional Change in the Plasma Membrane of Yeasts Associated with the Mechanism of Arsenate Resistance J. Cerbon and E. Llerenas 373
Cation Binding to Brain Plasma Membranes. An Evaluation of the Use of Anionic Fluorescent Probes K. S. Krishnan and P. Balaram 420
Solubilization of a Phospholipid-Stimulated Adenosine Triphosphatase Complex from Membranes of *Escherichia coli* P. D. Bragg and C. Hou 553
Phosphatidylinositol Exchange Protein Effects of Membrane Structure on Activity and Evidence for a Ping-Pong Mechanism
George M. Helmkamp, Jr., Karel W. A. Wirtz, and Laurens L. M. Van Deenen 592
Effect of Various Detergents of Kinetic Characteristics of Lipid Peroxidation Systems in Rat Liver Microsomes
V. M. Mishin, L. N. Pospelova, and V. V. Lyakhovich 630
Embryonic Chick Intestine in Organ Culture: Stimulation of Calcium Transport by Exogenous Vitamin D-Induced Calcium-Binding Protein
R. A. Corradino, C. S. Fullmer, and R. H. Wasserman 738

BIOCHEMISTRY OF VIRUSES AND NUCLEIC ACIDS

Characterization of Mouse Taper Liver Tumor Hepatoma Chromatin Autodigestion and the Release of Euchromatic Segments
Izhak J. Paul and Jacob D. Duerksen 491

PHOTOSYNTHESIS AND PLANT BIOCHEMISTRY

Changes in Properties of the Inner Mitochondrial Membrane during Mitochondrial Biogenesis in Aging Sweet Potato Tissue Slices in Relation to the Development of Cyanide-Insensitive Respiration Kenzo Nakamura and Tadashi Asahi 393
Photosystem II Reactions in Oxidant-Treated Chloroplast Fragments
David B. Knaff and Richard Malkin 414
NADPH- and NADH-Nitrate Reductases from Soybean Leaves
S. Omata Jolly, Wilbur Campbell, and N. E. Tolbert 431
Glycoprotein Biosynthesis in Plants. Formation of Lipid-Linked Oligosaccharides of Mannose and *N*-Acetylglucosamine by Mung Bean Seedlings
W. T. Forsee, George Valkovich, and Alan D. Elbein 469
Multiple Forms of Ferredoxin–Nicotinamide Adenine Dinucleotide Phosphate Reductase from Spinach Walter W. Fredericks and Judith M. Gehl 666

PHYSICAL BIOCHEMISTRY AND PHYSICAL CHEMISTRY OF MACROMOLECULES

Preferential Solvation of Methylmercurated Calf Thymus Deoxyribonucleic Acid
Joseph C. C. Fu and Dieter W. Gruenwedel 402
Thermal Perturbation Difference Spectra and D_2O vs H_2O Isothermal Difference Spectra of Protein-Model Aromatic Chromophores
Jake Bello and Helene R. Bello 532

Equilibrium Dialysis and Circular Dichroic Analysis of the Novobiocin-Bovine Serum Albumin Complex — Joseph G. Brand and T. Y. Toribara 541
The Self-Association of Jack Bean Ureases and Its Modification by Silver Ions — C. M. Kaneshiro and F. J. Reithel 647
Evidence for an Active–Inactive Subunit Complex in Jack Bean Urease — Stuart J. Staples and Francis J. Reithel 651

POLYSACCHARIDES AND COMPLEX CARBOHYDRATES

Oligosaccharides of Human Milk. Isolation and Characterization of Three New Disialylfucosyl Hexasaccharides — Katsuko Yamashita, Yoko Tachibana, and Akira Kobata 582
Lipid Intermediates Involved in the Assembly of Membrane-Associated Glycoproteins in Calf Brain White Matter — Charles J. Waechter, Janet L. Kennedy, and Joe B. Harford 726

PROTEIN SYNTHESIS

The *in Vivo* Inhibition of Collagen Synthesis and the Reduction of Prolyl Hydroxylase Activity by 3,4-Dehydroproline — Richard A. Salvador, Irene Tsai, Richard J. Marcel, Arthur M. Felix, and S. S. Kerwar 381
Purification and Properties of Rabbit Reticulocyte Elongation Factor — Wayne M. Kemper, William C. Merrick, Betty Redfield, Chen-Kao Liu, and Herbert Weissbach 603
Hemoglobin Transition in Erythrocytes of Developing Chick. Studies with Cell-Free Protein-Synthesizing Systems — A. Burl Henderson and John C. Lee 637

REGULATION OF METABOLISM AND OF ENZYME ACTION

Nucleotide Regulation of Phosphoenolpyruvate Carboxylase from *Escherichia coli* — Richard Silverstein 568
Purification and Characterization of a Purine-Nucleoside Phosphorylase from Bovine Thyroid — Thomas P. Moyer and Allan G. Fischer 622

STRUCTURAL PROTEINS

Further Studies on the Identity of Proteins at the Subunit Interface of the 70 S *E. coli* Ribosome — David J. Litman, Alice Beekman, and Charles R. Cantor 523

COENZYMES

Studies of the Ribosome-Associated Vitamin B_{12s} Adenosylating Enzyme of *Lactobacillus leichmanni* — Hiroshi Ohta and William S. Beck 713

COMMUNICATION

Lead Ion Activates Phosphorylation of Electroplax Na^+- and K^+-Dependent Adenosine Triphosphatase (NaK)-ATPase in the Absence of Sodium Ion — George J. Siegel and Suzanne K. Fogt 744
Analysis of Calorimetric Data for Isodesmic Self-Associating Systems — Leland P. Vickers and Gary K. Ackers 747

Author Index for Volume 174

Subject Index for Volume 174 will appear in the December (1976) issue as part of a cumulative index for the year 1976